CLAIMS

What is claimed is:

1.   A method for operating a switching node, comprising:

      maintaining a packet-switched fabric; and

      overlaying the packet-switching of the fabric with a repeating synchronized frame.

2.   A method according to claim 1, wherein overlaying the packet-switching of the fabric
with the synchronized frame further comprises:

      maintaining a table having a row of entries, each entry corresponding to a timeslot of the
            frame;

      populating the entries in the table according to a contention-free allocation; and

      transmitting a cell on a timeslot in accordance with the populated table.

3.   A method according to claim 2, wherein maintaining the table comprises maintaining a
timeslot-reservation table for TDM traffic, and wherein populating the entries in the table with a
contention-free allocation comprises populating the entries in the table with a contention-free
algorithm to provide exclusive reservation of timeslots in the frame for cells of TDM traffic.

4.   A method according to claim 3, wherein overlaying the packet-switching of the fabric
with the synchronized frame further comprises providing a contention-free allocation in time and
space of Time-Division-Multiplex (TDM) traffic using a Slepian-Duguid-based algorithm.

5.   A method according to claim 2, wherein maintaining the table comprises maintaining the table with a central management that manages tables of multiple switch interface devices in a system.

6.   A method according to claim 2, wherein transmitting the cell in accordance with the populated table further comprises transmitting cells of TDM traffic from multiple discrete switch interface devices, each according to a populated table, to avoid arbitration of the TDM traffic via a central scheduler at a core of the switch fabric.

7.   A method according to claim 1, further comprising

        providing a synchronization signal to demark the frame.

8.   A method according to claim 1, wherein overlaying the packet-switching of the fabric with the synchronized frame further comprises providing distributed switching of TDM traffic from multiple sources of TDM traffic over the fabric.

9.   A method according to claim 2, wherein populating the table comprises populating a TDM timeslot reservation table, and further comprising:

        preventing protocol data unit (PDU) traffic from being transmitted on a timeslot that is reserved for TDM traffic;

        determining whether an egress device has bandwidth that is not reserved for TDM traffic by the TDM timeslot reservations; and

transmitting PDU traffic to the egress device if it is determined that the egress device has

available bandwidth that does not contend with the TDM traffic reservations.

10.   A switching system comprising:

a packet-switched switching fabric;

multiple switch interfaces having a table of entries, each entry corresponding with a

timeslot on a frame, the multiple switch interfaces to transmit cells of traffic in

accordance with the entries in the table; and

a switch management circuit to define the frame and synchronize switching of traffic

over the fabric.

11.   A system according to claim 10, wherein the switch management circuit further populates

the entries in the table according to a contention-free allocation.

12.   A system according to claim 11, further comprising the switch management circuit to

manage the tables to provide timeslot-reservation table for Time Division Multiplexed (TDM)

traffic.

13.   A system according to claim 12, wherein the switch management circuit provides

modifications of the tables to the multiple switch interfaces.

14.   A system according to claim 10, wherein the switch management circuit to synchronize

the switching of traffic over the fabric further comprises the switch management circuit to

provide a synchronization signal to the switch fabric and the multiple switch interfaces to demark the frame.

15. A system according to claim 10, wherein the multiple switch interfaces are directly inter-connectable for system input to system output via the timeslots on the frame synchronized by the switch management circuit.

16. A system according to claim 10, wherein the switch management circuit further prevents protocol data unit (PDU) traffic from being transmitted on a timeslot that is reserved for TDM traffic, determines whether an egress device has bandwidth that is not reserved for TDM traffic by the TDM timeslot reservations, and transmits PDU traffic to the egress device if it is determined that the egress device has available bandwidth that does not contend with the TDM traffic reservations.

17. A system according to claim 10, wherein the switch fabric comprises multiple discrete switching circuits.

18. A system according to claim 10, wherein the multiple switch interfaces comprise multiple ingress/egress linecards.

19. A system according to claim 10, wherein the switch management circuit comprises a switch management linecard having a circuit to generate a synchronization signal and a circuit to provide management of the tables.